

A NEW FAMILY OF AUSTRALIAN FISHES.

BY J. DOUGLAS OGILBY.

The family, of which the following diagnosis is given, is intended to accommodate those forms of percesocoid fishes in which, among other characters which separate them from the *Sphyrænidæ* and *Atherinidæ*, the first dorsal fin is composed of a single pungent and two or more flexible, unarticulated rays, and by the position of the anal fin, which is more elongated and advanced than in the typical Atherinids, and which on account of its anterior insertion pushes forward the position of the anal orifice and of the ventral fins so far that the latter become thoracic, and the family thus makes a distinct advance towards the more typical Acanthopterygians.

To Prof. Kner and Dr. Steindachner, and subsequently to Count Castelnau, the claim of these little fishes to rank as a distinct family has commended itself. Prof. Kner, in 1865, alluded to the expediency of forming a family, *Pseudomugilidæ*, for the reception of certain small fishes, alleged to have been obtained by the collectors of the Novara Expedition at Sydney, and to which he gave the name of *Pseudomugil signifer*; he, however, gave no definition of the proposed family, though during the following year he, in conjunction with Dr. Steindachner, again makes incidental mention of the family while describing a closely allied genus, *Strabo*; these authors also neglect to formulate a diagnosis.

In 1873, Count Castelnau, after describing as new a genus which he named *Zantecla*, notices the differences in "its characters from all the families established till now," he being doubtless unaware of the previous discoveries of Drs. Kner and Steindachner; this author also places his genus "near the *Atherinidæ*," and considers that it "will be the type of a new family, which might be called *Zanteclidæ*." In the previous year the same author, after diagnosing a new genus as *Atherinosoma*, had suggested that it might prove necessary to form a new family for

its reception, and again in 1875, having formulated yet another new genus under the name of *Neoatherina*, he returns to the subject and proposes "forming on it a family to be called *Neoatherinidae*," which was also to contain the genus *Atherinosoma*.

We have, therefore, already three different families—*Pseudomugilidae*, *Zanteclidae*, and *Neoatherinidae*—proposed for the reception of different genera of these fishes, for not one of which has any diagnosis been even attempted.

To prevent confusion with these older undefined names, it has appeared advisable to me to suggest a new name for the family, though for reasons which I give below I am constrained to make that genus typical, which from its slight specialization is the least suitable; nevertheless, since Dr. Gill has already formulated for certain of these fishes a subfamily of the *Atherinidae* under the name *Melanoteniinae*, I do not feel justified in proposing to change his name for the more suitable one of *Rhombatractidae*.

There are several cogent reasons which point to this course as being the most fitting to pursue under the circumstances. Taking Castelnau's proposed families first:—

The use of *Zanteclidae* is precluded, its typical genus *Zantecla* being synonymous with and of later date than *Melanotenidia*, and therefore inadmissible; while *Neoatherinidae*, as well as being the last suggested name and belonging to a less distinctly specialized genus, is formed on a bastard title, the employment of which should be as much as possible deprecated, at any rate so far as the names of families are concerned; besides which it labours under the disability of having been associated by its author with a genus which undoubtedly belongs to the *Atherinidae* proper.

My choice, therefore, is restricted to the use of *Pseudomugilidae*—the only one of the three proposed names which in the author's opinion, is entitled to consideration—or to the substitution of *Melanoteniidae*, and I believe that I am consulting the best interests of science by taking the latter course, for the following reasons:—

Pseudomugilidae—also a bastard name, and therefore open to the same objection as *Neoatherinidae*—is misleading, since the

genera which are here segregated have little in common with the true Mugilids, but form conjointly a connecting link between the percesocoid and acanthopterygian types; furthermore, *Pseudomugil* is a small and obscure form, not ranking either in distribution or importance with *Melanotenia* or *Rhombotractus*.

I shall now proceed to give a diagnosis of the family, in which I include five genera—*Neoatherina*, *Pseudomugil*, *Rhombotractus*, *Aila*, and *Melanotenia*—which form a very natural group, characterised by the structure of the first dorsal fin, the advanced position of the ventrals, &c.

The metropolis of the family appears to be in north-eastern Australia, where no less than four of the genera have their home; thence it has spread northwards into the rivers of south-eastern New Guinea, westwards to Port Darwin and the Victoria River, south-westwards into the central districts of South Australia, and on, in the aberrant *Neoatherina*, to Swan River, and finally southward to the Richmond and Clarence Rivers District of New South Wales, and perhaps even as far as the Nepean watershed.

MELANOTENIIDÆ.

Pseudomugilidæ, Kner, Voy. Novara, Fische, p. 275, 1865 (*no definition*).

Pseudomugilidæ, Kner & Steindachner, Sitzb. Ak. Wiss. Wien, liv. 1866, p. 372 (*no definition*).

Zanteclidæ, Castelnau, Proc. Zool. & Acclimat. Soc. Vict. ii. 1873, p. 88 (*no definition*).

Neoatherinidæ, Castelnau, Res. Fish. Austr. p. 32, 1875 (*no definition*).

Melanoteninæ, Gill, American Naturalist, 1894, p. 708.

Body rhombofusiform to elongate-oblong, more or less compressed. Mouth moderate, terminal, oblique. Two nostrils on each side. Premaxillaries not protractile, forming the entire dentigerous margin of the upper jaw; maxillaries narrow. Gill-openings wide; gill-membranes separate, free from the isthmus; five or six

(seven ?) branchiostegals; pseudobranchiae present; gill-rakers short. Opercular bones entire; preopercle with a double ridge. Jaws and vomer toothed; palate with or without teeth; tongue smooth. Two separate dorsal fins; the first with a strong, acute spinous ray anteriorly, followed by two or more flexible, often elongate, unarticulated rays; the second with a similar strong spinous and several articulated and branched rays: anal similar to but more developed than the second dorsal: ventrals separate, thoracic, with one spinous and five soft rays: pectorals well developed, rounded: caudal emarginate, the peduncle stout. Body entirely scaly, the scales cycloid or ciliated, smooth; cheeks and opercles scaly; no scaly sheath to the vertical fins; no scaly process at the base of the ventrals; lateral line inconspicuous or absent. Air-vessel present, simple. Pyloric appendages wanting.

Small fishes from the fresh and brackish waters of tropical and subtropical Australia and southern New Guinea.

As indicated on a previous page I propose to associate in this group five genera, the diagnoses of which, so far as the scanty material available to me permits, will be found below, but unfortunately, from lack of specimens, I have not been in a position to personally examine any of these genera except *Rhom-batractus*, of which a detailed description is given, the principal characters of the remaining genera being taken from the works of their respective authors.

NEOATHERINA.

Neotherina, Castelnau, Res. Fish. Austr. p. 31, 1875.

Body subelongate, compressed, with the anterior portion of the back convex; snout pointed, rather projecting; mouth moderate and oblique, the upper jaw the longer. Teeth rather strong, in two series in the upper jaw, long and blunt anteriorly, triangular laterally; in the lower they are very numerous, in pavement form, with an external row of enlarged conical ones; anterior teeth in both jaws directed forwards; palate with several transverse series

of strong teeth.* Two dorsal fins, well separated; the first formed of one rather long spine and of four much longer filamentary rays; the second dorsal long, composed of one spine and eleven rays: anal fin long, with one spine and seventeen strong, spine-like rays: ventrals inserted far behind the base of the pectorals, and very little in advance of the insertion of the first dorsal, with one spine and six† elongate rays: pectorals small, with twelve rays: caudal forked. Scales large, ciliated; cheeks and opercles scaly; lateral line indistinct.

E t y m o l o g y :—*véos*, new; *Atherina*.

T y p e :—*Neoatherina australis*, Castelnau, l c. p. 32.

D i s t r i b u t i o n :—Swan River, West Australia.

In the increased number of the ventral rays (if correct), the ciliation of the scales and the character of the dentition *Neoatherina* differs from all the other Melanoteniids, while it approaches *Pseudomugil* in the presence of a lateral line; its affinity, however, to the melanotenioid rather than to the atherinoid forms is shown in one character, incidentally alluded to by Castelnau in the following terms :—"The small specimen has a more elongate form; the upper profile being much less convex . . ." This character was passed over as of little or no value by that author, probably because he was unaware of the sexual differences in form which are so strongly marked in his *Aristeus* (= *Rhombatractus*), but, in my opinion, it is significant of the systematic position of the genus, which, from the more backward insertion of the ventral fins, some authors might be inclined to retain among the true Atherinids.

* It is probable that, either through insufficient knowledge of the language or carelessness on the part of the author, there is some error in this sentence; either "vomer" should be substituted for "palate," or "longitudinal" for "transverse," probably the former.

† If this character be correct it is unique in the Percosocids.

PSEUDOMUGIL.

Pseudomugil, Kner, Voy. Novara, Fische, p. 275, 1865.

Body subelongate, compressed, with convex ventral profile; forehead broad and flat; snout short, with the mouth oblique; a band of acute teeth in both jaws; eyes large; preorbital smooth; two separate dorsal fins, the first with four or five flexible, unarticulated rays; scales large and cycloid, the lateral line little conspicuous. Air-vessel simple. Dorsal and ventral fins with elongate, filiform rays in the male. (*Kner*).

From the description of the only known species we also learn that the lower jaw projects slightly beyond the upper; the maxillary does not reach to the eye, and is almost entirely concealed beneath the preorbital; that the teeth in the jaws are small, acute, directed inwards, and arranged in a narrow band, the outer series being enlarged and almost caninoid, while there are no perceptible teeth on the palate.

The absence of palatine teeth, presence of an inconspicuous lateral line, and similarity in form of the sexes are the only important characters which are available for the separation of this from the succeeding genus, and it is quite possible that, when examples of the two can be compared, the line of demarcation will be found untenable, and *Rhombatractus* will have to merge in the older *Pseudomugil*.

Etymology:— $\psi\epsilon\upsilon\delta\omicron\varsigma$, false; *Mugil*.

Type:—*Pseudomugil signifer*, Kner.

Distribution:—York Peninsula. In the Voyage Novara it is alleged that the fishes from which Professor Kner's description was drawn up, were collected at Sydney, but this is manifestly erroneous, no member of the family being so far known with certainty to exist on the coastal watershed of our dividing range south of the Richmond and Clarence District, from whence the late Sir William Macleay described a species under the name of *Aristeus lineatus*. The locality here given

is that from which Dr. Günther received his *Atherina signata*, which is said to be identical with Kuer's fish.

RHOMBATRACTUS.

Aristeus (not Duvernoy) Castelnau, Proc. Linn. Soc. N.S. Wales, iii. 1878, p. 141.

Rhombatractus, Gill, American Naturalist, 1894, p. 709.

Body rhombofusiform or oblong, strongly compressed, with the dorso-rostral profile more or less emarginate, and the ventral profile convex; head small, the snout broad and depressed; mouth moderate, anterior, with oblique cleft, the lips thin; jaws equal or the lower a little the longer; premaxillaries not protractile, forming the entire dentigerous margin of the upper jaw, broad and projecting horizontally in front, narrow and oblique behind; maxillaries narrow, extending a little beyond the premaxillaries, entirely concealed beneath the preorbital except at the extreme tip. All the bones of the head entire, the preopercle with a double ridge. Gill-membranes separate, entirely free from the isthmus; gill-openings wide; five branchiostegals; pseudobranchiae present; gill-rakers widely separated, moderate, stiff, and serrulate. Jaws with a band of short, stout, conical teeth, which are more numerous in the lower, the outer series being much enlarged and recurved; vomer and palatine bones with narrow bands of small, stout, conical teeth; tongue toothless.* Two separate dorsal fins with v-vii, i 9-14 rays, the first not so long as the second and composed of one strong and a variable number of flexible, unarticulated, spinous rays, the second with a similar spine and several branched rays: anal fin originating beneath the base of the first dorsal and more developed than the second, with i 17-21 rays: ventral fins close together, thoracic, inserted a short

* The teeth on the vomer and some or all of those behind the anterior series upon the horizontal portion of the premaxillaries are occasionally wanting in adult specimens, and are probably more or less deciduous with age.

distance behind the base of the pectorals, with a slender spinous and five soft rays: pectorals rather small, moderately pointed, with 13-15 rays, those in the upper half of the fin the longest, the upper ray simple and somewhat inspissate: caudal fin emarginate, with short deep peduncle. Scales large, cycloid, smooth, not deciduous, the posterior border being more or less truncated, especially on the tail; cheeks, opercles except the outer ridge of the preopercle, and occiput scaly, the rest of the head naked; dorsal and anal fins without a basal scaly sheath; no enlarged scales at the base of the first dorsal, pectoral, or ventral fins, and no scaly process between the latter; lateral line wanting; a series of large open pores from the maxillary symphysis along the lower border of the preorbital, passing upwards in front of and above the eye to the occiput, where it connects with a similar series extending from the mandibular symphysis below the eye and round the naked outer preopercular surface. Vertebrae 33 to 37 (22 + 15 in *Rhombatractus fluviatilis*). Air-vessel large and simple. Abdominal cavity very large, extending backwards far beyond the vent, the intestines very long and convoluted.

Etymology:—*ῥόμβος*, rhomb; *ἄτρακτος*, a spindle; in allusion to its shape.

Type:—*Aristeus fitzroyensis*, Castelnau.

Distribution:—Fresh waters of Australia as far south as the 32nd parallel, and of southern New Guinea.

The sexual differences are strongly marked in these fishes, both as regards the form of the body and the development of the fins.

In adult males the depth of the body is much greater than in females of the same age; for instance, in a series of specimens of *Rhombatractus fluviatilis*, collected from a single haul in Yulpa Creek, near Deniliquin, the depth of the males is from $2\frac{1}{2}$ to $2\frac{3}{4}$, of the females from $3\frac{1}{3}$ to $3\frac{1}{4}$ in the total length: this variation is entirely due to the slight development in the latter of the post-occipital convexity, which is so pronounced a character in the males, the rostro-dorsal contour in the females being gently and evenly arched from the extremity of the snout to the caudal peduncle.

The caudal peduncle in the male is a little deeper than long, in the female a little longer than deep.

The development of the dorsal, anal, and ventral fins shows similar sexual distinctions; thus, the flexible spines of the first dorsal, the posterior rays of the second dorsal and of the anal, and the outer rays of the ventral fins are prolonged into filaments in the males, while in females and immature males this character is inconspicuous or absent.

Though not the oldest, this genus is by far the most important of the group, whether as regards its degree of specialization, area of distribution, or number of species.

Up to the year 1878, when Castelnau first described this genus under the name *Aristeus*, all but one of the authors (Richardson, Günther, Kner, and Steindachner), who had written on the fishes which are here collected together in one family, had recognised their affinity to the Atherinids, the exception being Dr. Peters; and though Castelnau himself, first in proposing to separate in a distinct family his closely allied genus *Zantecla* (= *Melanotenia*), which, as he says, "comes near the *Atherinidae*," definitely gives in his adhesion to this view, and two years subsequently endorsed this recognition by proposing to separate from that family his two new genera, *Atherinosoma* and *Neoatherina*, which he coupled, notwithstanding their manifest differences, as *Neoatherinidae*, he nevertheless, in spite of his acquaintance with two of the genera—*Melanotenia* and *Neoatherina*—and his acknowledgment of their connection with the true Atherinids, commits the extra, ordinary error of referring *Aristeus* to the *Gobiidae*, a family with which it has not the slightest affinity, either in its external or its internal structure; this error is perpetuated by Macleay and others.

In 1886, in a paper on the fishes obtained by the collectors of the New South Wales Geographical Society's Expedition to New Guinea, I described two very distinct species from the Strickland River, substituting for *Aristeus* Peters' name *Nematocentris*, this being, so far as I knew at that time, the earliest attempt to

remove Castelnau's genus to its true systematic position; however, as was kindly pointed out to me by Dr. Gill, Steindachner had previously recognised the close relationship of these two genera (Zoöl. Jahresb. 1879, p. 1061).

Mr. Zietz, the latest writer on the subject, who has followed Steindachner and me in making *Aristeus* synonymous with *Nematocentris*, refrains from enlightening us as to his views of the systematic affinities of this genus; two new species from Central Australia are described by this author, who places them (Horn Exped. Centr. Austr. pp. 178-9) between the Theraponids and the Eleotrine Gobiids, below which *Gobius* itself is ranked, thus securing so wide a margin for selection that we are left in doubt as to the family in which he is in favour of leaving it, though we would be justified in inferring that he considers Castelnau correct in allying *Aristeus*—and, therefore, by his own admission of the identity of the two genera *Nematocentris*—with *Eleotris*, since by no possibility could the perciesocoid fishes be so placed.

Curiously enough Castelnau himself, in the same pamphlet in which the diagnosis of *Neotherina* is published, described yet another new genus as *Aida*, of the close relationship of which to *Rhombatractus* I shall have something to say further on, and places it “with considerable doubt in the family of the *Percidae*,” that is to say, in that section of Günther's *Percidae*, which we should now call *Apogonidae* or *Chilodipteridae*; there it is left without comment by Macleay.

Prior, however, to the publication of Castelnau's paper, Dr. Peters had already assigned to his genus *Nematocentris* a position near to the Apogons, although the species on which his diagnosis was formed had been described many years previously by Richardson as *Atherina nigrans*, and holds a place in Günther's Catalogue as *Atherinichthys nigrans*; Kner and Steindachner, however, in the same year point out the affinity existing between *Nematocentris* and the Atherinids, though none of these authors appear to have suspected the identity of their respective species with that of Richardson.

The above remarks will, however, suffice to show how diverse the views of authors have been as to the position which these fishes and their allies are entitled to hold in the ichthyological system.

AIDA.

Aida, Castelnau, Res. Fish. Austr. p. 10, 1875.

Body very compressed; upper part of the head unequal; opening of the mouth very oblique, almost perpendicular; opercle and preopercle without teeth or spines, the first with a double edge. Teeth fine, minute, disposed on one line; two very feeble canine teeth in front of the upper jaw; a transverse line of teeth on the palate. Two dorsal fins, the first composed of five spines, the four last prolonged; the second with one spine and thirteen rays, which increase in length backwards: anal with two spines and seventeen rays, formed like the second dorsal: ventrals inserted behind the pectorals and united at their base, formed of one spine and five rays: pectorals placed at about half the height of the body, rather small: caudal bilobed. Scales rather large and entire on their edges, the posterior part of the head and the opercle covered with scales similar to those of the body; no lateral line. (*Castelnau*).*

Etymology:—unknown.

Type:—*Aida inornata*, Castelnau.

Distribution:—Gulf of Carpentaria.

If an analysis be made of the differences between the above description and that of *Rhombatractus*, it will be found that they are but slight and such as, bearing in mind the care-

* With the exception of rearranging the sequence of the sentences and of omitting some unnecessary words no change has been made in Castelnau's own phraseology; and these transpositions have been undertaken merely to bring the above diagnosis into sequential accordance with that of *Rhombatractus*, and so make the comparison of the two genera easier for those who follow me in the study of these interesting forms.

lessness which characterises Castelnau's work, may be easily set aside or explained away; the main differences are as follows :—

(i.) *Gill-covers*.—Castelnau writes : “opercle and preopercle without teeth or spines, the first with a double edge.” This is probably mere carelessness; by substituting “last” for “first” the description would be quite correct.

ii.) *Dentition*.—By turning to the foot-note p. 124 my readers will find that I there suggest that certain of the teeth in *Rhombattractus* may be deciduous with age, and it is merely necessary to carry this deciduousness a little further to arrive at a dentition somewhat similar to that described by Castelnau.

(iii.) *Fin rays*.—“Anal with two spines.” I do not think it necessary to attach much importance to this character, seeing that Castelnau was possessed of but one specimen from which to draw up his description. It may be taken for granted that in all these small fresh-water fishes the first soft ray is liable to take the form of an additional spine, and it would, of course, be but natural to describe this genus as having two anal spines if the diagnosis was taken from an example having this individual peculiarity.

As an instance of this tendency I may mention that when some years ago a species of *Ambassis* was present in great abundance in the Parramatta and George's Rivers, I noticed that in a number of specimens taken at random almost as many would be found having two rays in front of the second dorsal as those having one, and this increase was always coordinated with a corresponding decrease in the number of soft rays, thus plainly showing that this was not a structural character, but a simple, though common, variation caused by the calcification of the anterior soft ray.

That Castelnau on the one hand was either unaware of or paid no attention to this tendency to acanthination in fresh-water fishes, while on the other hand placing undue prominence on the presence of one or more additional spines, we know from his own writings and from his treatment of *Macquaria australasica*, of

which fish he makes, in a single paper (Proc. Zool. & Acclimat. Soc. Vict. i. 1872, pp. 57 & 61-64), no less than five new species, which he distributes in three different genera, two of which are described as new,* the principal reason given being the disagreement in the number of the dorsal spines; thus, referring to *Dules christyi*, he writes:—"It is so much like *Murrayia cyprinoides* in form that I should have thought it belonged to the same species had it not been for the difference in the number of the spines of the first dorsal." And in the diagnosis of *Riverina* the following passage occurs:—"This genus is very nearly allied by its form to *Murrayia*, but the dorsal has twelve spines." *Murrayia* has eleven spines and twelve rays, *Riverina* twelve spines and eleven rays.

(iv). *Lepidosis*.—Of the gill-covers only the opercle, according to Castelnau, is scaly; but even here by the simple substitution of "opercles" for "opercle" the diagnosis would be sufficiently close for that author.

I think, therefore, that it is quite possible that when Castelnau penned his description of *Aida* he had a specimen of *Rhombattractus* before him, and in any case, until I am satisfied that the differences relied on are constant and are supported by other structural characters, I am content to consider *Aida* a true Melanotæniid.

MELANOTÆNIA.

Melanotania, Gill, Proc. Acad. Nat. Sc. Philad. 1862, p. 280.

Nematocentris, Peters, Monatsb. Ak. Wiss. Berlin, 1866, p. 516.

Strabo, Kner & Steindachner, Sitzb. Ak. Wiss. Wien, liv. 1866, p. 372 (1867).

Zuntecla, Castelnau, Proc. Zool. & Acclimat. Soc. Vict. ii. 1873, p. 88.

* These are *Dules christyi*, p. 57; *Murrayia g  ntheri*, p. 61; *M. cyprinoides*, p. 62; *M. bramoides*, p. 63; and *Riverina fluvialis*, p. 64.

Body fusiform, little compressed, with the dorso-rostral profile slightly curved; snout short, depressed, prominent; mouth small, with horizontal cleft. Opercle spineless; preopercle with a double ridge. Gills four; six branchiostegals; pseudobranchiæ present. Jaws, vomer, and palatines with a band of villiform teeth, the outer series in the former being enlarged, conical, and curved. Two separate dorsal fins, the first with one stout and four or five slender, flexible rays, the second longer, with one spine and nine to twelve articulated and branched rays: anal long, with a single stout spine: ventrals thoracic. Scales of moderate size, cycloid, with the margins feebly crenulated. No lateral line. Pyloric appendages in small number. Air-vessel simple.

Etymology:— $\mu\acute{\epsilon}\lambda\alpha\varsigma$, black: *ταβία*, a band.

Type:—*Melanotenia nigrans*, Gill, = *Atherina nigrans*, Richardson.

Distribution:—Fresh and brackish waters of northern and eastern Australia, extending southwards at least as far as the Richmond River District, and possibly further since, after describing *Aristeus fluvialilis*, Castelnau remarks:—"I have two specimens of this fish, one, two and a half inches long. It comes from the Murrumbidgee . . . the other was found by Mr. Duboulay in Rope's Creek, and is three and a half inches long. It has a very feebly marked black longitudinal stripe on each side." This latter specimen is probably a *Melanotenia*, and the locality given would bring the range of that genus as far south as the metropolitan district.

It is much to be regretted that owing to the uncertainty which prevails as to the correct name of the genus which I have called *Rhombatractus* in this paper, I have been obliged to adopt as the sponsor of the family a genus which is distinctly less specialized and, in its little compressed, non-ventradiform body more closely approaches to exotic forms than the others. If I could have satisfied myself that future investigations would justify the separation of *Rhombatractus* from *Pseudomugil* and *Aida*, I should

certainly have preferred to name the family *Rhombatractidae*, that genus being the most highly specialized and most widely diffused of all the forms at present known.

In reference to the position which this family is entitled to hold in the system, I am unable to agree with those authors who would place it between the *Atherinidae* and the *Mugilidae*, much less with those who would associate it with the *Eleotrinæ* or the *Apogonidae*; but though the position of these fishes near *Apogon* is untenable, it cannot be denied that there is considerable external resemblance between them and some Ambassids; in *Naunoperca*,* for instance, we find the same posterior insertion of the ventrals, reduced number of branchiostegal rays (six as in the Ambassids, not seven as in the Apogonids), absence or irregularity of the lateral line, and concavity of the dorso-rostral contour.

That, however, its affinities are distinctly percesocoid I believe that no one, who is acquainted with one or more of the various forms, and who has more than a superficial knowledge of fishes in general, will deny, and it is only, therefore, with regard to the degree of affinity which exists between it and the other Percesocids that I am at issue with those scientists who would make it a link between the Gray Mulletts and the Atherines.

The forward position of the ventral fins, which is so characteristic of this family, marks a decided advance in the direction of the more typical Acanthopterygians, while the increased strength of the dentition clearly points to relationship with the *Sphyrnidae*, in which family we find, in our *Dinolestes*, an example of the tendency towards an enlargement of the anal fin and consequent advancement of the position of the ventral fins.

It seems to me, therefore, that the most natural sequence in which to place the Percesocids with relation to other fishes would be as follows :—

* *Paradules*, Klunzinger (not Bleeker) and *Microperca*, Castelnau (not Putnam) are synonymous, and very closely allied to if not identical with *Nannoperca*; *Microperca yarræ* = *Paradules obscurus*.

Suborder—SYNENTOGNATHI.*

Suborder—PERCESOCES.

Family—MUGILIDÆ.

„ A THERINIDÆ.

„ S P H Y R E N I D Æ.

„ M E L A N O T Æ N I I D Æ.

Suborder—ACANTHOPTERYGII.

Appended is a list of the Melanotæniids described up to the present time :—

1. *Neoatherina australis*, Castelnau, Res. Fish. Austr. p. 32, 1875. Swan River, West Australia.
2. *Pseudomugil signifer*, Kner, Voy. Novara, Fische, p. 275, 1865. Sydney, New South Wales.
3. *P. signata*; = *Atherina signata*, Günther, Ann. & Mag. Nat. Hist. (3) xx. 1867, p. 64. Cape York, Queensland.
4. *Rhombatractus fitzroyensis*; = *Aristeus fitzroyensis*, Castelnau, Proc. Linn. Soc. N.S. Wales, iii. 1878, p. 141. Fitzroy River, Queensland.
5. *R. fluviatilis*; = *Aristeus fluviatilis*, Castelnau, l.c. Murrumbidgee River, New South Wales.
6. *R. rufescens*; = *Aristeus rufescens*, Macleay, Proc. Linn. Soc. N.S. Wales, v. 1880, p. 625 [1881]. Rivers of Northern Queensland.
7. *R. lineatus*, = *Aristeus lineatus*, Macleay, l.c. p. 626. Richmond River, New South Wales.
8. *R. cavifrons*; = *Aristeus cavifrons*, Macleay, l.c. vii. 1882, p. 70. Palmer River, Queensland.

* Possibly the Lophobranchiate fishes should intervene between the Hemirhamphids and the Percesocii.

9. *R. goldiei*; = *Aristeus goldiei*, Macleay, l.c. viii. 1883, p. 269.
Goldie River, New Guinea.
10. *R. perperosus*; = *Aristeus perperosus*, De Vis, Proc. Linn.
Soc. N.S. Wales, ix. 1884, p. 694.
11. *R. nova-guinea*; = *Nematocentris nova-guinea*, Ramsay &
Ogilby, Proc. Linn. Soc. N.S. Wales (2) i. 1886, p. 13.
Strickland River, New Guinea.
12. *R. rubrostriatus*; = *Nematocentris rubrostriatus*, Ramsay &
Ogilby, l.c. p. 14. Strickland River, New Guinea.
13. *R. loria*; = *Aristeus loria*, Perugia, Ann. Mus. Genov. (2)
xiv. 1894, p. 549.
14. *R. tatei*; = *Nematocentris tatei*, Zietz, Rep. Horn Exped.
Centr. Austr. Zool. p. 178, f. 2, 1896. Finke River,
South Australia.
15. *R. winneckei*; = *Nematocentris winneckei*, Zietz, l.c. p. 179,
f. 3. Finke River, South Australia.
16. *Aida mornata*, Castelnau, Res. Fish. Austr. p. 10, 1875.
Gulf of Carpentaria.
17. *Melanotania nigrans*; = *Atherina nigrans*, Richardson, Ann.
& Mag. Nat. Hist. xi. 1843, p. 180. Rivers of North
Australia. As before remarked (p. 131) the same species
may range nearly as far southward as Sydney, but
much confusion exists as to the members of this genus.
Dr. Günther apparently is content to consider the four
species identical, but I think that any such conclusion,
based on the small material available to him, is hasty, and
that judging by analogy with the allied genus *Rhombat-*
tractus, the distribution of which is also wide but the
species of which are known to be numerous, it is unwise
to unite in one species all the black-banded forms from
widely separated parts of the continent.
18. *M. splendida*; = *Nematocentris splendida*, Peters, Monatsb.
Ak. Wiss. Berlin, 1866, p. 516. Fitzroy River, Queensland.

19. *M. nigrofasciata*; = *Strabo nigrofasciatus*, Kner & Steindachner, Sitzb. Ak. Wiss. Wien, liv. 1866, pp. 373, 395, pl. iii. f. 10, [1867], and lv. 1867, p. 16. Brisbane and Fitzroy Rivers, Queensland.
20. *M. pusilla*; = *Zantecla pusilla*, Castelnau, Proc Zool. & Acclimat. Soc. Vict. 1873, ii. p. 88. Port Darwin, North-West Australia.

In the above list I have made no attempt to indicate the degree of affinity between any of these species, but it is generally conceded that *Atherina signata*, Günther, is identical with *Pseudomugil signifer*, and that *Nematocentris splendida*, Peters, and *Strabo nigrofasciatus*, Kner & Steindachner, cannot be separated specifically from *Melanotenia nigrans*; *Zantecla pusilla*, Castelnau, is a good species in my opinion.

It is, however, improbable that all the twelve described species of *Rhombatractus* are tenable, but I trust soon to be in a position, with the cooperation of other scientific societies and of individual students, to publish in this Journal a monograph of the family with original descriptions of all the species.